DAIRY CREST LTD, DAVIDSTOW ENVIRONMENTAL PERMIT VARIATION, ENVIRONMENTAL RISK ASSESSMENT

This environmental risk assessment has been produced as part of Dairy Crest's environmental permit variation application (2022) in relation to Davidstow Creamery. It applies to the following developments /changes at the site:

- Creamery Project No. 1: 4-hour clean-in-place (CIP);
- Creamery Project No. 2: Milk protein standardisation;
- Creamery Project No. 3: Milk fat standardisation;
- Creamery Project No. 4: Whey protein concentration;
- Creamery Project No. 5: GOS bulk loading;
- Creamery Project No. 6: Cheese capacity growth phase 3; and
- Redevelopment of the WPF: this comprises a number of changes and improvements at the WPF with the overall objective of increasing the efficiency and resilience of the wastewater treatment processes.

Further details on each of the above changes, including a full list of the individual changes at the WPF, is provided in the main environmental permit variation application supporting report.

The environmental risk assessment has been undertaken in accordance with the methodology set out in Environment Agency guidance "Risk assessments for your environmental permit" in the GOV.UK website (https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit).

The Davidstow site is operated in accordance with an Environmental Management System (EMS) which is certified to ISO 14001. The existing EMS will continue to be implemented at the site and it will be reviewed and updated as necessary in order to reflect any changes introduced by the permit variation.

What you do that can harm and what could be harmed			Manging the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
Spillage of raw milk during delivery and storage (Note: The permit variation application does not include any new milk silos or offloading facilities)	Soil / vegetation River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that hardstanding fails)*	Deliveries of raw milk take place in the designated milk reception area. This area will be kept clear. No new milk intake bays / offloading facilities are being installed and therefore this risk is not considered to change / increase as a result of the permit variation being applied for. Off-loading takes place above concrete hardstanding with spill containment kerbs and the area is connected to a sealed drainage system. Hardstanding will be monitored for any signs of damage (i.e. cracks, holes) and replaced / repaired as necessary. A written unloading procedure is already implemented due to existing site operations. Trained operators will control and supervise milk offtake operations and will take appropriate action in the event of a spillage / leak during deliveries. Milk storage silos are purpose designed and are monitored as part of the site's Planned Preventative Maintenance Programme (PPMP) for any signs of deterioration. High-level alarms and level indication equipment are fitted to the milk silos to prevent overfilling.	Low	Contamination of soil, surface water, groundwater	Not significant if management practices adhered to

			Spill equipment is in place and the Emergency Spillage Procedure will be followed in the event of a spill. If raw milk enters the drainage system in the offloading area it would go to the WPF via the trade effluent drains and, therefore all effluent / run-off will be treated prior to discharge to the River Inny. Depending on the quantity it would most likely be held in the Divert Tank and slowly introduced to the WPF treatment process or it could be tankered off site if required. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			
Spillage of CIP (and other) chemicals during delivery, storage and use (due to failure of storage tanks and / or human error) (Note: The permit variation application	Soil / vegetation River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that hardstanding fails)*	Unloading of bulk chemicals is carried out in designated areas of the site by trained staff following site and haulage contractors' Chemical Delivery Procedures. There are various designated existing storage areas on site for bulk chemicals, either located within the process buildings or externally within bunded areas. In terms of the new CIP set recently installed, the CIP chemicals (caustic/acid) are stored in stainless steel tanks located on concrete hardstanding within the Creamery building.	Low	Contamination of soil, surface water, groundwater	Not significant if management practices adhered to

includes new CIP Set 7 which provides three additional cleaning channels and incorporates new chemical storage tanks)			Acids, alkalis and flammables are stored separately to prevent incompatible materials mixing. Access to the CIP chemical storage areas is controlled to designated personnel only and the areas are regularly inspected and maintained. Any issues such as leaks, overflows, or accidental spills are reported to relevant site management and addressed appropriately. The on-site drainage design means that any spillages of chemicals during delivery or storage will not reach surface water drains but be directed via the trade effluent drains to the WPF. Chemical spill equipment is available and the Emergency Spillage Procedure will be followed in the event of a spill. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			
Spillage of GOS from new bulk loading facility (due to failure of storage tank	Soil / vegetation River Inny Surface water lagoon and attenuation pond	Site drains Surface water Percolation through soil Groundwater percolation *(in the*	GOS bulk loading is carried out in a designated area of the site comprising a loading bay which is located adjacent to the powder dispatch area. The bulk loading process is managed and supervised by trained staff in accordance with relevant operational procedures.	Low	Contamination of soil, surface water, groundwater	Not significant if management practices adhered to

and / or human error) (Note: GOS bulk loading is a new activity included in the permit variation application)	Adjacent drainage ditches Groundwater beneath site	*event that hardstanding fails)*	The GOS export storage tank comprises a 25,000 litre stainless steel tank located on concrete hardstanding inside the Creamery building. The tanks and storage area are regularly inspected and maintained. Any issues such as leaks, overflows, or accidental spills are reported to relevant site management and addressed appropriately. The on-site drainage design means that any spillages of GOS will not reach surface water drains but be directed via the Creamery trade effluent drains to the WPF. Spill equipment is available and the Emergency Spillage Procedure will be followed in the event of a spill. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			
Spillage of process effluent from the WPF (due to failure of storage tanks and associated infrastructure	Soil / vegetation River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that*	The WPF is operated by trained personnel and written procedures are in place for process management of the effluent and overall operation of the various infrastructure aspects and processes. New procedures will be developed, as necessary, for any new infrastructure that is implemented at the WPF.	Low	Contamination of soil, surface water, groundwater	Not significant if management practices adhered to

and / or human error) (Note: The permit variation application includes a number of new process tanks at the WPF, such as the AFM tanks, flow attenuation tank and tertiary filters filtrate tank)	Groundwater beneath site	*hardstanding fails)*	The new upgraded AFM tanks and tertiary filters filtrate tank are located within buildings, which provide secondary containment, at the WPF. Whilst the flow attenuation tank is not located within a building it only stores final treated effluent, to prevent surges in flow to the river. A downgradient perimeter containment wall has been installed to the downgradient portion of the WPF which acts as an additional bund; the design has been calculated so that the WPF can contain at least 110 % of the largest tank size. Any effluent that drains this way is collected in a sealed sump and returned to the WPF. Therefore, if effluent were to escape within the WPF area, it would be contained and routed back to the head of the works. All new tanks, bunds and other infrastructure at the WPF will be subject to regular inspection and maintenance; and damage will be repaired. Tanks are fitted with volume monitors and alarm systems, as necessary, which activate in the event of certain volume levels being exceeded. A written procedure, inspection regime and PPMP will be developed and implemented for all new tanks, pipework, pumps and secondary containment. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in			

			accordance with the requirements of the environmental permit.			
Spillage of WPF chemicals during delivery, storage and use (due to failure of storage tanks / containers and / or human error) (Note: The permit variation application includes a new area of land to be incorporated into the installation boundary, located adjacent to the WPF, for storage of chemicals).	Soil / vegetation River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that hardstanding fails)*	All deliveries of WPF chemicals are supervised and take place in a designated area (within the new chemical storage area). The delivery area is always kept clear. Unloading of chemicals in IBCs chemicals is carried out by trained staff following delivery procedures. Chemicals are stored within IBCs housed in self bunded steel containers in the new chemical storage area. Any surplus chemicals which cannot be housed within the steel containers will be stored within IBCs on pallet sumps. A separate Site Condition Report (SCR) for this piece of land has been included as part of the environmental permit variation application which has considered, in detail, the chemicals that are to be stored and primary, secondary and tertiary containment features. All containers and the store itself are regularly inspected and maintained. All tanks and containers meet relevant standards, are resistant to the chemicals being stored and provided with secondary containment. Any issues such as leaks, overflows, or accidental spills will be reported to relevant site management and addressed appropriately. Any personnel handling chemicals are appropriately trained and required to wear suitable PPE. Chemical spill equipment is available and the Emergency Spillage Procedure will be followed in the event of a spill.	Low	Contamination of soil, surface water, groundwater	Not significant if management practices adhered to

			Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			
Leaks / spillages of oil / fuel during delivery, storage and use (site wide) (Note: Oil / fuel delivery, storage and usage will not change as a result of the environmental permit variation being applied for. However, it has been included here for completeness.)	Soil / vegetation River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that hardstanding fails)*	All deliveries are supervised and take place in designated areas on concrete hardstanding at the Creamery. The delivery area is always kept clear. Unloading of oil / fuel is carried out by trained staff following site and haulage contractors' delivery procedures. All tanker / delivery operations on site follow traffic management routes and are always supervised by site staff. Oil / fuel is stored in designated bunded areas located on concrete hardstanding at the Creamery. All tanks, containers and bunds meet relevant standards and are regularly inspected and maintained. The on-site drainage design means that any spillages of oil / fuel which were to reach surface water drains at the Creamery would be diverted, via the site interceptors interceptor, to the onsite surface water lagoon and attenuation pond. In the event that the spill was to reach either of these surface water bodies the emergency shut-off valve would be activated to prevent any contamination from leaving the site (monitoring instrumentation is provided for pH,	Low	Contamination of soil, surface water, groundwater	Not significant if management practices adhered to

			oil and turbidity with an automatic slam shut valve which operates in the event of a failure). Any issues such as leaks, overflows, or accidental spills will be reported to relevant site management and addressed appropriately. Oil spill equipment is available on site and the Emergency Spillage Procedure will be followed in the event of a spill. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			

ODOUR RISK ASSESSMENT AND MANAGEMENT PLAN

What you do that can harm and what could be harmed			Manging the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
Note: The environmental permit variation being applied for includes six Creamery projects plus various changes made as part of the redevelopment of the WPF and enhancement of the water recovery plant; a summary of these changes is presented above in the introduction to this risk assessment and full details are provided in the main environmental permit variation application document. With respect to odour, the main raw material (milk) is not inherently odorous and the Creamery projects are predominantly located within the Creamery building. The activities undertaken at the WPF are considered to have the greatest potential to generate odours. However, with the exception of the new contingency lagoon, none of the changes on site are considered to have the potential to generate significant odours, in fact a number of changes being applied for have the specific objective of minimising odorous emissions (refer to Section 5.5 in the main environmental permit variation application document for further details). An Odour Impact Assessment has been undertaken to support the permit variation application and this demonstrates that the changes implemented on site are expected to significantly reduce odour emissions and associated impacts at identified sensitive receptors relative to the 2017 baseline. Odorous emissions from the WPF are considered in the risk assessment below, however, as detailed above, the changes implemented on site are not considered to have the potential to generate significant odours. The exception to this is the contingency lagoon and this is considered as a separate and specific source / hazard in the risk assessment below.						
Odour releases from WPF processes during normal operations	The closest odour sensitive receptors to the WPF are predominantly located in the nearby villages of Trewassa, Treworra, Davidstow and Tremail	Air	The WPF is operated in accordance with documented procedures and an Odour Management Plan (OMP), which both form part of the site's EMS. All relevant documents will be reviewed and updated as necessary to incorporate the changes on site that form part of the permit variation application. Extensive monitoring and assessment of odorous emissions at the WPF is regularly performed to define and quantify the main sources of odour. Where required, mitigation measures have been identified and implemented; in particular, BT1 and the divert tank at the WPF have been covered and	Low	Odour nuisance and pollution	Low if management practices adhered to

			emissions routed via an OCU in response to such work. The sludge centrifuges and trailer at the at the WPF have also been enclosed to minimise odorous emissions. A fundamental principle of the proposed permit variation is to improve the management of process effluent waste streams at the Creamery in order to manage a consistent flow and load of untreated effluent to the WPF. Proactive controls are then implemented at the WPF itself to minimise odour, including monitoring, mixing and aeration, sludge management and equipment maintenance. On-site odour monitoring is undertaken and if required, based on the results, an off-site assessment of odour downwind of the WPF is performed. An Odour Complaint Log is used to record any complaints which are fully investigated, remedial action taken as appropriate and feedback provided to the Environment Agency and / or complainant. Odour monitoring and complaint records are also evaluated as part of annual management review in order to assess trends and target opportunities for improvements.			
Receipt of abnormal effluent loads at the WPF which could shock the system / overload the plant and cause odour release	The closest odour sensitive receptors to the WPF are predominantly located in the nearby villages of Trewassa, Treworra,	Air	Following the changes made on site, the likelihood of the receipt of abnormal effluent loads at the WPF shocking / overloading the system is significantly reduced. The new contingency lagoon provides additional buffer storage capacity at the main Creamery for process effluent generated during other than normal operating conditions. The discharge of effluent / wastewater from the contingency lagoon	Low	Odour nuisance and pollution	Low if management practices adhered to

	Davidstow and Tremail		will only take place after monitoring has been undertaken to confirm an appropriate treatment route. Changes to the configuration of the WPF have been implemented to facilitate the reinstatement of the Divert Tank as a true means of diverting higher strength / volume effluents to temporary storage to enable them to be gradually reintroduced to the combined effluent treated by the DAFs. Implementation of additional process monitoring to control odour has also been introduced – monitoring of Dissolved Oxygen (DO) in BT1 / Divert Tank and hydrogen sulphide (H2S) (as a proxy for total odour) in the headspace of both tanks is undertaken. Periodic monitoring at the inlet / outlet the OCUs is performed to help assess and check the abatement efficiency. Enhanced automation and controls to manage wastewater streams have also been implemented on site with the introduction of continuous automatic monitoring, for example, the provision of pH control on the Divert Tank which further prevents odorous emissions. The operations team at the Creamery notify the WPF team of any abnormal flows that are generated / released to drain. There is an existing documented procedure in place which details the actions to be taken in the event of abnormal flows. All process effluent entering the WPF is monitored and, in the unlikely event that abnormal loads reach the downstream WPF, they will be directed to and held in the existing Divert Tank, which has been reinstated. In this situation, the abnormal load / high strength effluent would be gradually trickled / blended into the DAF system for			

			treatment or it can be tankered off site if it is unsuitable for treatment at the WPF. As detailed previously, the WPF is operated in accordance with documented procedures and an OMP, which both form part of the site's EMS. On site and off site odour monitoring is performed, complaints are logged, fully investigated and appropriate remedial taken.			
Odour from BT1 and Divert Tank	The closest odour sensitive receptors to the WPF are predominantly located in the nearby villages of Trewassa, Treworra, Davidstow and Tremail	Air	BT1 and the Divert Tank have been covered with a Glass Reinforced Plastic (GRP) lid and the air displaced from the covered headspace of the tanks is treated via an OCU, in order to minimise odours, before discharge to atmosphere. This provides additional contingency (on top of that provided by operation of the contingency lagoon) to minimise odour emissions at the WPF associated with failure modes at the Creamery The provision of tank covers also reduces the base level of odorous emissions during steady state operation of the Creamery and WPF. This helps to improve the overall resilience of the WPF and enables it to be operated effectively under a wider range of process conditions. The OCU comprises a three-stage scrubber incorporating a wet scrubber followed by two dry scrubbers. The OCU system requires minimal operator input and maintenance, however, it is inspected, monitored and maintained in accordance with the manufacturer's recommendations. Dairy Crest undertakes periodic olfactometry monitoring surveys at the site to identify and monitor odorous emission sources and help inform management techniques. The OCUs are	Low	Odour nuisance and pollution	Low if management practices adhered to

			also monitored (OU/s at the inlet / outlet) to check the abatement efficiency.			
Odour from contingency lagoon	The closest odour sensitive receptors to the WPF are predominantly located in the nearby villages of Trewassa, Treworra, Davidstow and Tremail	Air	The new contingency lagoon provides additional buffer storage capacity at the main Creamery for process effluent generated during other than normal operating conditions. The discharge of effluent / wastewater from the contingency lagoon will only take place after monitoring has been undertaken to confirm an appropriate treatment route. The risk of odour emissions resulting from the contingency lagoon is considered to be low as it is constructed below ground from cast concrete. The lagoon is covered / enclosed; this prevents rainwater ingress which would reduce the effective capacity and have the potential to increase odour emissions as a result of exposure of the lagoon surface to the prevailing wind. Air displaced from the covered headspace is collected and treated via an OCU, in order to minimise odours, before discharge to atmosphere. The OCU comprises an AWT Peacemaker Dry-Filter Scrubber incorporating AWT Triox, AWT Diox, AWT ADS-C and AWT carbon media. Regular odour monitoring is undertaken from the OCU; any abnormal readings are recorded in the Odour Monitoring Log and appropriate corrective action taken.	Low	Odour nuisance and pollution	Low if management practices adhered to

What you do that can harm and what could be harmed			Manging the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
Note: The environmental permit variation being applied for includes six Creamery projects plus various changes made as part of the redevelopment of the WPF and enhancement of the water recovery plant; a summary of these changes is presented above in the introduction to this risk assessment and full details are provided in the main environmental permit variation application document. With respect to noise, most of the changes at the Creamery comprise internal project updates, i.e. they are located inside the main Creamery building and, therefore, they do not have the potential to cause a significant change in noise levels at the closest noise sensitive receptors. The activities undertaken at the WPF are considered to have the greatest potential to generate noise e.g. new aeration pumps, downstream tertiary filters, OCUs etc. However, as is the case for odour, a number of changes being applied for have the specific objective of minimising noise emissions (refer to Section 5.6 in the main environmental permit variation application document for further details). A Noise Impact Assessment has been undertaken to support the permit variation application and this demonstrates that operational noise levels from the changes covered by the proposed permit variation will be substantially below the prevailing sound levels at the closest receptors to the Creamery and the WPF. Noise emissions from the WPF are considered in the risk assessment below, however, as demonstrated by the Noise Impact Assessment, the changes implemented on site are not considered to give rise to any observable change in noise levels.						
Vehicle movements and raw material deliveries / product exports (site wide)	The closest noise sensitive receptors are predominantly located in the nearby villages of Trewassa, Treworra, Davidstow and Tremail	Sound propagation through the air	Vehicle numbers are not expected to increase significantly as a result of the changes on site. However, the following risk management measures will continue to be implemented. Existing speed limits and designated traffic management routes which are already imposed at the Creamery and WPF will remain in place. Vehicle engines will not be left idling. Route management at site should minimise the use of reversing alarms. Vehicle movements to and from site predominantly take place during normal office hours.	Low	Increased noise levels at receptors	Low if management practices adhered to

Noise from WPF changes	The closest noise sensitive receptors are predominantly located in the nearby villages of Trewassa, Treworra, Davidstow and Tremail	Sound propagation through the air	Most of the changes implemented at the WPF do not have the potential to generate noise, e.g. upgraded AFM tanks, 3rd RO plant, flow attenuation tank and 4th MBR. Only the new DAFs, OCUs, downstream tertiary filters, and new aeration pumps for BT1 are considered to be noise generative. Where feasible this equipment is located inside buildings to minimise noise emissions. Other changes at the WPF have been designed to reduce noise emissions from the site, such as the installation of a perimeter containment wall ranging from 1.5 to 3 m high and 27 m of acoustic fencing between BT1 / Divert Tank and Trewassa. A Noise Impact Assessment has been undertaken to support the permit variation application and this demonstrates that the changes implemented on site are not considered to give rise to any observable change in noise levels. All plant and equipment is subject to routine inspection and maintenance in accordance with manufacturers' recommendations and the sites PPMP. This will reduce the likelihood of noise occurring due to failed equipment and / or worn out parts that need servicing / replacing. Any noise complaints will be investigated in accordance with procedures within the EMS. Any corrective actions identified will be implemented accordingly.	Low	Increased noise levels at receptors	Not significant if management practices adhered to
Noise from Creamery Changes	The closest noise sensitive receptors are	Sound propagation through the air	All of the changes implemented at the Creamery (i.e. Creamery Projects 1-6) are located inside the factory building and,	Low	Increased noise levels at receptors	Not significant if management

	predominantly located in the nearby villages of Trewassa, Treworra, Davidstow and Tremail		therefore, they do not have the potential to cause a significant change in noise levels. Consequently, specific noise mitigation or management measures are not required for these projects. A Noise Impact Assessment has been undertaken to support the permit variation application and this demonstrates that the changes implemented on site are not considered to give rise to any observable change in noise levels. Nonetheless, all plant and equipment is subject to routine inspection and maintenance in accordance with manufacturers' recommendations and the sites PPMP. This will reduce the likelihood of noise occurring due to failed equipment and / or worn out parts that need servicing / replacing. Any noise complaints will be investigated in accordance with procedures within the EMS. Any corrective actions identified will be implemented accordingly.			practices adhered to

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FUGITIVE EMISSIONS RISK ASSESSMENT AND MANAGEMENT PLAN

What you do that can harm and what could be harmed			Manging the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
Litter	Local residences Adjacent land River Inny	Air (wind-blown)	Any additional raw materials received and products removed from site will be in bulk containers such as drums / IBCs or tankers which will not generate litter waste. The permit variation application does not include any changes which are considered to increase the risk of litter from the site. Any litter complaints will be investigated in accordance with procedures within the EMS. Any corrective actions identified will be implemented accordingly.	Very low	Increased litter nuisance at receptors	Not significant if management practices adhered to
Pests	Local residences Adjacent land River Inny	Air / water / land	All processes take place within buildings or enclosed vessels / tanks / silos and, as such, they do not particularly attract pests. Waste is segregated and stored in appropriate containers in designated areas of the site and removed by licensed contractors. The site has a third-party pest contractor who regularly attends site for the control of pests. The permit variation application does not include any changes which are considered to increase the risk of pests at the site. Any pest complaints will be investigated in accordance with procedures within the EMS. Any corrective actions identified will be implemented accordingly.	Very low	Increased pest nuisance at receptors	Not significant if management practices adhered to

Dust	Local residences Adjacent land River Inny	Air / water / land	None of the activities described in this permit variation application will generate significant dust. The main potential to generate dust is from vehicle movements with mud being tracked on to site from local roadways. If this is the case a road sweeper will be hired to clean access routes and main trafficked areas on site. Any dust complaints will be investigated in accordance with procedures within the EMS. Any corrective actions identified will be implemented accordingly.	Very low	Increased dust nuisance at receptors	Not significant if management practices adhered to

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ACCIDENTS RISK ASSESSMENT AND MANAGEMENT PLAN

What you do that can harm and what could be harmed			Manging the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk?
Note: The following accident scenarios have already been considered in the above risk assessment tables (land and groundwater contamination) along with the proposed risk management measures: - Spillage of raw material (milk) during deliveries - Spillage of CIP (and other) chemicals during delivery, storage and use - Spillage of GOS from the new bulk loading facility - Failure of process effluent tanks and infrastructure - Spillage of WPF chemicals during delivery, storage and use - Leak and spillages of oil and fuel during delivery, storage and use Additional accident scenarios are considered in the table below.						
Failure of raw milk intake silos and milk intake lines (including associated infrastructure such as agitators, valves and instrumentation)	River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Soil / vegetation Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that hardstanding fails)*	No new milk silos or milk intake lines have been installed or are proposed. The permit variation application does not include any changes which are considered to increase the risk of failure of the milk silos. All milk silos and intake lines are located on concrete hardstanding. Regular monitoring with regards to the condition of milk intake silos and the raw milk intake lines will take place as per existing site planned preventative maintenance procedures. Any deformities or signs of damage will be reported to management and addressed appropriately (i.e. repaired). High-level alarms and level	Low	Contamination	Not significant if management practices adhered to

			indication equipment are fitted to silos to prevent overfilling. Site emergency procedures will be followed in the event of a failure of a milk storage silo and associated equipment, including the raw milk intake line. Spill equipment is available and the Emergency Spillage Procedure will be followed in event of a spill. If raw milk enters the drainage system in this part of the site it will go to the WPF via the trade effluent drains, therefore all effluent / run-off will be treated prior to discharge to the River Inny. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			
Failure of storage or process tanks or leaks / spills during loading to / from tankers e.g. GOS storage tank, CIP tanks, AFM and filtrate tanks etc.	River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Soil / vegetation Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that hardstanding fails)*	Most new tanks (and associated pipework) installed as part of the changes on site are located on concrete hardstanding within buildings, which will provide secondary containment. In the event of any leaks from these tanks / pipes the contents would be captured by the process effluent drains in the building and delivered to the Divert Tank or contingency lagoon, depending on the effluent composition.	Low	Contamination	Not significant if management practices adhered to

Also applies to failure of pipework whilst transferring materials. (Note: A list of all tanks included as part of the changes on site is provided in Section 5.4 of the main permit variation application report.)			The exceptions to this are the CIP hot water, fresh water and drain attenuation tanks, which are located externally. In the event of a leak the contents would be captured by the surface water drains and delivered to the attenuation pond. Regular monitoring with regards to the condition of all tanks, tanker loading areas and pipework takes place as per site planned preventative maintenance procedures. Any new plant and equipment installed as part of the changes on site will be added to the site's PPMP. Any deformities or signs of damage will be reported to management and addressed appropriately (i.e. repaired). High-level alarms and level indication equipment will be fitted to relevant tanks to prevent overfilling. Site emergency procedures will be followed in the event of a failure of storage tanks and associated equipment, including loading pipework, e.g. at the GOS bulk tanker loading area. All transfers of material to / from tankers are supervised by site personnel and the tanker driver. Appropriate spill equipment (that is suitable to the material being stored / handled in that part of this site) is available, and the Emergency Spillage Procedure will be followed in event of a spill. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements.			

			Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			
Accidental mixing of incompatible CIP chemicals could cause: - Fume generation - Explosion - Release of hazardous material into the environment from damaged infrastructure	Air River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Soil / vegetation Groundwater beneath site	Air Site drains Surface water Percolation through soil Groundwater percolation *(in the event that hardstanding fails)*	All CIP programmes are software controlled and interlocked so that acid and alkalis cannot be mixed at the same time in process vessels and pipework as part of the cleaning cycle. All acid / alkali pipework has valves on to seal each pipe when chemicals have been provided to each cycle. Any issues such as leaks, overflows, or accidental spills will be reported to relevant site management and addressed appropriately. Any personnel handling chemicals will be required to wear appropriate PPE. Spill equipment will be made available and the Emergency Spillage Procedure will be followed in the event of a spill. The CIP systems are only operated by trained personnel and written procedures are in place. New procedures will be developed, as necessary, for operation of the new / changes to existing CIP sets and these will be incorporated into the existing EMS.	Low	Contamination Harm to human health	Not significant if management practices adhered to
Blocked drainage / pipework systems leading to potential leaks or bursts	River Inny Adjacent drainage ditches Soil / vegetation Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater percolation *(in the event that*	Regular monitoring of the condition of pipework transferring process effluent, chemicals and raw materials take places as per site planned preventative maintenance procedures. Any deformities are reported to management and addressed appropriately (i.e. repaired). Any plant and equipment installed as part of the changes on site described in this permit	Low	Contamination	Not significant if management practices adhered to

		hardstanding fails)	variation application will be added to the site's PPMP. Site emergency procedures will be followed in the event of a failure of any pipework or drainage system. Spill equipment is available and the Emergency Spillage Procedure will be followed in event of a spill. Any spills / leaks are recorded in accordance with the EMS and are reviewed as part of annual management review in order to assess trends and target opportunities for improvements. Any potential impact to the ground or river will be reported to the Environment Agency in accordance with the requirements of the environmental permit.			
Failure of monitoring equipment (potentially leading to discharge of effluent outside of emission limit values) (ELV)	River Inny	WPF and Discharge Point W2	Treated effluent will continue to be discharged to the River Inny via existing discharge point W2. However, as part of the redevelopment of the WPF, new monitoring equipment, an MCERTS flume and an emergency slam shut valve are being installed. All monitoring equipment is regularly inspected and maintained as per the manufacturer's recommendations. Any faulty equipment will be repaired or replaced. In the event that repair or replacement of monitoring equipment is required, periodic monitoring would resume in the interim period to check compliance against the permitted ELVs.	Low	Contamination	Not significant if management practices adhered to

			Monitoring equipment is MCERTS where available and calibrated in accordance with requirements. Only fully competent staff are responsible for ensuring that monitoring equipment is operating efficiently and as expected. Relevant emergency procedures are in place to address the event of monitoring equipment failure which could lead to discharges of effluent not conformant to the emission limit values / parameters established in the site's environmental permit. The Environment Agency will be notified via a Schedule 5 Notification in the event of discharge to the River Inny which exceeds permitted limits and an appropriate course of action followed.			
Failure of mains electricity	None (unless failure of electricity caused knock on effects to other receptors already identified in this risk assessment)	None (unless failure of electricity caused knock on effects via other pathways already identified in this risk assessment)	Installation of the 5 MW DC photovoltaic solar power plant run by Lightsource BP provides the facility with up to 5,318 MWh energy per year. This is able to supply electricity for critical equipment in the event of a grid supply failure. The plant would be shut down in a controlled manner / certain operations would cease if there was a significant loss of electricity supply which the solar plant alone could not provide the required amount of energy for.	Very low	None	Not significant
Deterioration of plant / equipment due to lack of maintenance	River Inny Surface water lagoon and attenuation pond	Site drains Surface water Percolation through soil	A written procedure, inspection regime and PPMP for all plant and equipment forming part of the changes will be developed and implemented. Maintenance is carried out in accordance with manufacturers' recommendations by Dairy	Low	Contamination Odour Harm to human health	Not significant if management practices adhered to

	Adjacent drainage ditches Soil / vegetation Groundwater beneath site Surrounding residential properties	Groundwater percolation *(in the event that hardstanding fails)* Air	Crest's maintenance team and external approved contractors. Any operational or maintenance issues will be reported to relevant Management teams and will be addressed appropriately (i.e. repair work undertaken, replacement plant / equipment fitted where necessary). Failures of equipment will be monitored under the preventative maintenance programme to identify trends and to ensure failures are captured before they happen where practicable. Spill equipment is available and the Emergency Spillage Procedure will be followed in the event of a spill.			
Fire	River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Soil / vegetation Groundwater beneath site Surrounding residential properties	Site drains Surface water Percolation through soil Groundwater Air	Fire alarm systems are already in place at the site. The system will be maintained and tested according to Fire and Rescue service recommendations. Fire extinguishers are available at various points around the site and staff are instructed on how to use these. An emergency procedure incorporating actions to be taken in the event of a fire is already in place. This will be reviewed and updated as necessary following the changes. All staff are informed of the emergency procedure with regards to fire and the emergency plan is subject to periodic drills. Nominated fire wardens are also in place at the site. Preventative maintenance on all electrical systems are conducted annually by an approved contractor.	Low	Contamination Odour Impact on human health	Not significant if management practices adhered to

Failure to contain fire water run-off	River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Soil / vegetation Groundwater beneath site	Site drains Surface water Percolation through soil Groundwater	Fire prevention measures as detailed above. Fire water will be contained on site. Surface water drainage system valves will be shut off to prevent releases. Firewater can be directed to drainage and be held in the Divert / Balance Tanks and or surface water lagoon and attenuation pond. This can then be tested prior to either treatment on site or tankering off-site for treatment.	Low	Contamination	Not significant if management practices adhered to
Flooding / heavy rainfall	River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Soil / vegetation Surrounding residential properties	Site drains Surface water Percolation through soil Groundwater Air	An emergency procedure incorporating actions to be taken in the event of a flood is already in place at the site. This will be reviewed and updated as necessary following the changes.	Low	Damage to plant and equipment Contamination Odour	Not significant if management practices adhered to
Intruders on site causing vandalism / sabotage of plant and equipment	River Inny Surface water lagoon and attenuation pond Adjacent drainage ditches Soil / vegetation Surrounding residential properties	Site drains Surface water Percolation through soil Groundwater Air	The site is located in an agricultural area, with perimeter fencing surrounding the site boundary and access only permitted through the designated site entrance. All visitors at the site have to sign in at the gatehouse. The site gates are locked out of operational hours. Security personnel and CCTV systems are in place at strategic locations around site.	Low	Contamination Harm to human health Odour	Not significant if management practices adhered to